Royal Academy of Sciences of Berlin, have already been referred to. Dr. von Siemens was a member of many learned societies, and only in the spring of this year he was elected one of the sixteen honorary members of the Institution of Civil Engineers. The late Emperor Frederick III. of Germany conferred upon him the patent of nobility in 1888, and the present Emperor has expressed his sympathy with his sorrowing widow and family.

Dr. Siemens was unfortunately one of those attacked during the influenza epidemic, and although he recovered from it, it left him weak, and he has since been ailing more than once. A work on which he has been spending his spare moments was an autobiography, giving reminiscences of himself and of the firm of Siemens and Halske. This was published in Berlin a fortnight ago. On Tuesday, the 6th inst., Dr. Werner breathed his last at half-past six in the evening, just within a week of completing his seventy-sixth year. It may truly be said of him that, although he has passed from us, his life's labours will ever endure, having left an indelible mark on the world's progress.

The funeral took place on Saturday. The London, Belfort, Vienna, and St. Petersburg factories of the firm of which the deceased was a member, sent officials and workmen; the many thousands following the hearse, and the respectful attitude of the bystanders in the streets through which the funeral procession passed testifying to the regard in which he was held. The Emperor William was represented by Prince Leopold, the Empress Frederick by Count Seckendorff, and the German Empire by Chancellor Caprivi. Science and art and industry, the City of Berlin and the town of Charlottenburg were represented by deputies and deputations, all combining to do honour to one esteemed of all. E. F. B.

NOTES.

We are glad to announce that Sir Archibald Geikie has undertaken to write the Life of Sir Andrew C. Ramsay, his predecessor in the Geological Survey. Sir Andrew Ramsay spent nearly the whole of his scientific career in the service, so that the record of his life and the story of the progress of the Survey are closely bound together. This is the third member of the staff of the Survey whose memoirs Sir Archibald Geikie will have written, the two others being Edward Forbes (whose Life he wrote in conjunction with the late Prof. George Wilson) and Sir Roderick Murchison. Sir Archibald joined the staff under Ramsay, and grew into the closest relations of friendship with him.

We regret to have to record the death of Mr. H. T. Stainton, F.R.S. He died on December 2 at the age of seventy. He was indefatigable in his study of entomology, to which he made many important contributions. His chief work is "Natural History of the Tineina," in four languages, with many plates. His "Manual of British Butterflies and Moths" is also well known. Mr. Stainton was one of the founders of the *Entomologists' Monthly Magazine*, and remained to the end of his life one of its editors. He was for many years secretary of the Ray Society and of the Zoological Record Association, and one of the secretaries of Section D of the British Association. From 1848 he was a Fellow of the Entomological Society, of which he was at one time president; and from 1859 he was a Fellow of the Linnean Society, of which he was at one time vice-president. He was elected a Fellow of the Royal Society in 1867.

The Chemical Society held a special meeting on Tuesday, the anniversary of the death of Stas. A paper, prepared for the occasion by Prof. J. W. Mallet, F.R.S., on "Jean Servais Stas, and the measurement of the relative masses of the atoms of the chemical elements," was read and discussed.

The new Victoria buildings of University College, Liverpool, which include the Jubilee Tower, were formally opened on Tuesday. Lord Spencer, as Chancellor of the Victoria University, took part in the ceremony. At a banquet held in the evening, Mr. Bryce announced that the Queen, out of certain funds belonging to the Duchy of Lancaster, had been pleased to bestow upon the two great Lancashire Colleges a sum of £4000, to be applied in some permanent form, such as might be agreed upon by the authorities of the Colleges, particularly the principals, to commemorate the event of that day, and Her Majesty's interest in the growth of the institution.

On Monday, at Merchant Taylors' Hall, Dr. William Anderson presented the prizes in connection with the City and Guilds of London Institute for the Advancement of Technical Education. Afterwards, addressing the students, Dr. Anderson called attention to the extraordinary advantages enjoyed by students of the present day in comparison with those within the reach of students of the past generation. In nearly all towns men and women were improving their knowledge in almost every branch of art and science to which their necessities or their inclinations led them. He had come to the conclusion that the aids given nowadays to manufactures and commerce were absolutely indispensable if England was to hold her own, and to overcome the difficulties which high-priced labour, the restrictions of the Legislature, and the interference of trade organizations imposed.

Dr. T. Jeffrey Parker, F.R.S., of Dunedin, Otago, New Zealand, who is now in this country, will read a paper on the cranial osteology, classification, and phylogeny of the Moas (Dinornithidæ) at the Zoological Society's meeting on the 14th of February.

The committee appointed by the Board of Agriculture to inquire into the plague of field voles in Scotland have declined for the present to recommend the adoption of the plan lately carried out in Thessaly by Prof. Loeffler, who claims to have got rid of voles in that district by feeding them with prepared bait containing the germs of mouse typhus. It is thought that Prof. Loeffler may not have attached sufficient weight to other causes which have doubtless operated to reduce the swarms of voles in Thessaly, such as the heavy rains which on the low ground would flood the holes and runs of the mice. The chairman of the committee, Sir Herbert Maxwell, and the secretary, Mr. J. E. Harting, with the sanction of the Board of Agriculture and of the Treasury, are about to proceed to Thessaly for the purpose of taking evidence there and reporting.

A new edition of M. Alphonse Bertillon's important book on "Identification Anthropométrique" will be published in January. The book has been entirely recast and considerably enlarged. It is the result of ten years of observation, and has been prepared, not merely for the anthropometric service directed by the author, but for all who desire to have a proper comprehension of man's physical qualities. In addition to the copies intended for the use of the penal administration of the French Ministry of the Interior, a small number of copies will be reserved for persons who may desire to subscribe for them.

On the evening of Thursday the 8th instant a deep barometric depression advanced upon our north-west coasts, and proceeded with considerable rapidity in a south-easterly direction, completely traversing Great Britain, as far as Dover, and travelling throughout its course at the rate of about 36 miles an hour. Its passage was accompanied by gales and by heavy rain or sleet, with severe snowstorms on the east coast. This disturbance passed away to the eastward, and was followed on Saturday by a fresh depression which appeared in the north-west, causing a strong gale in that district, and heavy squalls in most other parts. The changes of temperature were very irregular, the air being warm and moist under the influence of the cyclonic systems, but cold and relatively drier in the rear of the disturbances; in Scotland the frost was at times severe, the lowest of the minima being as low as 8° in the east of Scotland. In the early part of the present week a temporary improvement took place, with a generally rising barometer and falling thermometer, but these conditions soon gave place to a fresh disturbance in the north-west, accompanied by south-westerly winds generally. The *Weekly Weather Report* for the period ending the 10th instant showed that the temperature was below the mean in all districts, the greatest deficiency being about 7° over the northern parts of the kingdom. Rainfall exceeded the mean in the north-west of England and the north of Ireland, but in all other districts it differed little from the average amount. Bright sunshine was more prevalent than for many weeks past, except in the north of Scotland, where only 5 per cent. of the possible amount was registered.

A FOREIGN OFFICE "Report on the Social and Economical Condition of the Canary Islands" (No. 246, 1892) contains some details with respect to the climate. There is no record of the freezing point having been touched at Laguna (Teneriffe), 1840 feet above the sea. At Vila Flor, also in Teneriffe, 4335 feet above the sea, the highest point where cultivation exists, the lowest temperature recorded in 1890-91 was 28°; the lowest reading at the sea level during the same period was 49°. The highest summer reading at Laguna was 104°·9 in 1885. The average maximum temperature near the sea in the summer is about 82°. The annual rainfall at Laguna is 29·4 inches, but at Santa Cruz (Teneriffe), at the sea level, it is only about 11 inches, and at Las Palmas it is as low as 8·4 inches. The greater part of the rain falls in the Monte Verde, where the vapour is carried from the sea by the trade wind. The rain generally begins early in October and ceases early in May.

THE country between the Nile and the Red Sea has not always been so barren as it is to-day. There is ample evidence that in former times bodies of cavalry from three to five hundred in number ranged without commissariat difficulties over districts which are now deserts. The Arabic names of the valleys are names for trees, and there can be little doubt that at one time the valleys abounded with the trees after which they were called. How is the change to be explained? Much light is thrown on the problem by a most interesting paper printed in the new number of the *Kew Bulletin*, to which it has been communicated by Mr. E. A. Floyer, F.L.S., Inspector-General of Egyptian Telegraphs. It is an extract from the report (which will be published in French by the Egyptian Government) of the expedition despatched by the Khedive to this region in 1891. The writer believes that the mischief has been done during the last twelve hundred years, and that it is to be attributed to the Arab and his camel; the camel having eaten the leaves and shoots of the trees, the Arab having converted into charcoal the stem, root, and branch. The writer is inclined to state the matter thus: So long as the valleys were all the Arab had to depend on for feeding his camels, so long he preserved his trees for his camels. But by degrees some Arabs got a footing in the Nile Valley. They hired their camels to the farmer to carry their harvest. They went back to their deserted valley and brought away the trees in form of charcoal. Thus the land was gradually made bare. If this explanation is correct—and there is evidently much to be said for it—the writer points out that a like cause may be invoked over large areas to explain, for example, the disappearance of the frankincense and spices from Southern Arabia, to explain the thousands of chariots and horsemen in Palestine, and to explain how in early times a greater fertility and population existed in many countries whose history, like that of Palestine, seems out of proportion to their present circumstances. It is a pity, by the way, that in so good a paper nature should be spoken of as having produced in the camel "a Frankenstein." Frankenstein in the story was not the monster, but the monster's creator.

IT is by no means certain that the harm which the camel is capable of doing in Egyptian territory has even yet been exhausted. The writer of the report considers it possible that the prosperity in Egypt in which all Englishmen are rejoicing may seal the destruction of the remaining trees, and leave the country bare save of *Calotropis procera* and the plants which nourish a few sheep and donkeys, attended by herdsmen, fed by grain from the Nile Valley. "The camel," he says, "will then, having so to speak burnt its boats, be domesticated in the Nile Valley. And it is interesting to speculate as to how he will develop there. Already the massive Cairo camel is a type distinct from other camels, surpassing all in its cumbrous massive proportions."

THE December number of the *Kew Bulletin* contains, besides the paper on the disappearance of desert plants in Egypt, interesting sections on the Taj Gardens, Agra; Indian gutta-percha; the Gold Coast botanical station; Ramie machine trials at New Orleans; Lord Bute's "Botanical Tables"; and miscellaneous notes. Reference was made to the "Botanical Tables" in the historical account of Kew, printed in the *Bulletin* in 1891, p. 291. Since that was written the authorities at the Royal Gardens have had an opportunity, through the gracious permission of the Queen, of examining the copy in the Royal Library at Windsor, which formerly belonged to Queen Charlotte, to whom the work was dedicated. On the fly-leaf of the first volume of the Windsor copy is the following note in pencil, written by the Rev. John Glover (appointed Royal Librarian by William IV.):—"Of this work only sixteen copies were printed for presents, at a cost, it is said, of more than £10,000. This copy belonged to Queen Charlotte, and was purchased at the sale of Her Majesty's Library for, I believe, £100." There seem, however, to have been only twelve copies. The general nature of the contents is indicated in the *Bulletin*. There are nine volumes, and the work contains 654 plates, all of them apparently drawn and engraved by John Miller, an excellent German artist—Johann Sebastian Mueller, who thus anglicised his name.

CEYLON is sending to the Chicago Exhibition a complete reproduction of a Buddhist temple and many interesting specimens of ancient Sinhalese art, including, according to the *Ceylon Observer*, "exquisitely-carved pillars, massive doorways and dados, beautiful windows and frescoed panellings of courts." There will also be, among other things, a display of jewellery, lace, and pottery. It is hoped that these treasures will do something to further in America "the interests of the most modern product of Ceylon, tea."

AT the recent meeting of the Congress of Americanists at Huelva, Mrs. Zelia Nuttall, of the Peabody Museum of American Archæology and Ethnology, Cambridge, Massachusetts, presented a preliminary note on the calendar system of the ancient Aztecs. Guided by a statement in a Hispano-Mexican MS. which she has recently discovered in the National Central Library of Florence, Mrs. Nuttall claims to have found the key to the Aztec calendar system. She exhibited tables showing that the Mexican cycle was 13,515 days, and that it comprised 52 ritual years (less five days at the end of the cycle), of 260 days each, or 51 lunar years of 265 days each, based on nine moons, or 37 solar years each of 365 days. At the end of the fifty-first lunar year 10 intercalary days placed the solar years in agreement with the lunar years in such a manner that the new cycle recommenced in the same solar and lunar positions as the 13,515 preceding days. Each period commenced with a day bearing one of the four names: *acatl*, *tecpatl*, *calli*, *tochtli*. The calendar system and tables, 14 metres long, designed to illustrate this communication, were subsequently placed on exhibition in the Spanish section of the Historical Exhibition at Madrid. Her Majesty the Queen of Spain commanded that Mrs. Zelia Nuttall should be presented to her, and expressed much interest in her work.

NO one expects to see the corncrake in Great Britain after the summer months. According to the *Llangollen Advertiser*, a specimen was caught last Thursday in the neighbourhood of Pentrefelin, Llangollen. Several local naturalists have seen the bird, and agree that it is a corncrake.

A NEW luminous fungus has been forwarded to Europe from Tahiti. It is said to emit, at night, a light resembling that of the glowworm, which it retains for a period of twenty-four hours after having been gathered, and it is used, by the native women, in bouquets of flowers for personal adornment in the hair and dress. It belongs to the section "dimidiati" of the genus *Pleurotus*, in which no luminous species has been hitherto known, although there are several in the genus, and has been named by M. Hariot *Pleurotus lux*. It is believed to grow on the trunks of trees.

A THEORETICAL investigation of the conditions under which Lippmann's coloured photographs are produced is given by M. G. Meslin in the *Ann. de Chim. et de Phys.* for November. He maintains that the colours produced are complex, and belong to the higher orders of Newton's scale. This is illustrated by the change in colour observed when the thickness of the film increases. When moist air is blown upon it the film swells, and the bright colours give way to others consisting principally of red and green. The impure nature of the spectrum ordinarily obtained would account for its "metallic" appearance. Besides, there is a blue or greenish-blue region which extends beyond the red end of the spectrum. The composite nature of the colours reflected from the surface of the spectrum photograph may be shown by projecting a similar spectrum upon the film. The colours will then appear very brilliant. But if, for instance, the green is projected upon the red of the film, green is reflected all the same, although less distinctly than before. The same thing happens in other parts of the spectrum. On moving it from the violet towards the red, the violet, arriving at the green portion, is interrupted by a broad band. On further displacement this band, the breadth of which is about equal to the distance between the E and the b lines, moves through the green and yellow and reaches the red. At this moment the blue and violet regions show the greatest brightness. There is only one band observed throughout. This observation is in accordance with the thickness attributed to the layers, viz. between 200 and 350$\mu\mu$. Hence the paths traversed by the light will range from 400$\mu\mu$ to 700$\mu\mu$, giving $\frac{\lambda}{2}$ for none of the colours, $\frac{3}{2}\frac{\lambda}{2} = 600\mu\mu$ for the violet, 650$\mu\mu$ for the blue, and 700$\mu\mu$ for the green. It will be still greater, *i.e.* $\frac{3}{2}\frac{\lambda}{2}$ for the red, in the infra-red region of the spectrum. There we shall have a black band in the red, while the blue is at its maximum, owing to the retardation being equal to two wave-lengths. Hence the blue region beyond the red corresponds to the infra-red region of the incident spectrum, which in long exposures is able to produce a photographic effect.

DURING the year 1891 about 450 more persons were killed by wild beasts in India than during the preceding year. The number in 1890, however, was abnormally low, and the *Pioneer Mail* calculates that last year's figures were about 250 in excess of the mean. In one district of Bengal—Hazaribagh—no fewer than 205 deaths were due to a single brood of man-eating tigers. The yearly average of persons destroyed by wild beasts in our Eastern dependency is between 2500 and 3000. The mortality from snake-bite is on a much larger scale. Year by year it varies from something over 21,000 to something over 22,000.

AN excellent account of the Experiment Stations established in the United States in the interest of agriculture is given by Mr. R. Warington, F.R.S., in a paper issued by the National Association for the Promotion of Technical and Secondary Education. A fully equipped Experiment Station, he says, is a large and costly piece of machinery, embracing many departments of work. There is one in every State of the Union, and in some States there are more than one; the total number is fifty-four. These Stations are endowed by Congress, £3000 a year being paid to the Station or Stations of each State. If the income derived from the State Legislatures, and from other sources, be included, the average income of each Station is nearly £4000. In nearly every instance the station is connected with the States Agricultural College, and the Station buildings are in its immediate vicinity. The publications of the Stations are made in the form of periodical bulletins and annual reports; for the printing of these a special grant is made by the State, and they are distributed by the Federal Government post free. The issues are very large: 60,000 copies of each Station bulletin are printed in Ohio. Any farmer in the State can at his request receive the bulletins regularly without payment. Mr. Warington expresses a hope that our own County Councils may be encouraged to try to do for agriculture in Great Britain what is so energetically done for it in America by the various States.

A SERIES of investigations on soils is in progress at the Maryland Agricultural Experiment Station, in co-operation with the U.S. Department of Agriculture and the Johns Hopkins University. So far the work has been on the physical structure of the soil and its relation to the circulation of soil water, and the physical effect of fertilizers on soils as related to crop production. The surface tension of various solutions was first of all determined. The solutions chosen included common salt, kainit, superphosphate of lime, soil extract, and ammonia. The soil extract was made by shaking up a little soil with just sufficient water to cover it. The water was afterwards filtered off and used for the determination. This operation reduced the surface-tension of water considerably, but the experiments do not appear sufficiently complete to indicate reasons for this. Analyses of the soils are not given. Ammonia and urine lowered the surface-tension of water considerably below that of the soil extract, and still more below that of pure water. Common salt and kainit increase the surface tension of water, and no doubt this is the reason why the application of these substances to the soil tends to keep it moist, whereas the excessive use of nitrogenous manure has the reverse effect.

THE Chamber of Commerce at Reims has published the statistics of the trade in champagne since 1844. In 1844-45 the value of the trade was 6,635,000 francs, and in the following year it exceeded seven millions. In 1868-69 it amounted to nearly sixteen millions, but fell to nine millions in 1870-71, and then rose in 1871-72 to twenty millions. The value in 1872-73 was twenty-two millions, and it oscillated between this sum and seventeen millions until 1889-90, when it became twenty-three millions. The figures were 25,776,000 in 1890-91; 24,243,996 in 1891-92. The number of bottles used in France rose from 2,225,000 in 1844-45 to 4,558,000 in 1891-92, while the number exported rose during the same period from 4,380,000 to 16,685,900. The year in which most bottles were sent abroad was 1890-91 (nearly twenty-two millions).

MESSRS. SWAN, SONNENSCHEIN AND CO. have issued a translation, by Dr. E. L. Mark, Professor of Anatomy in Harvard University, of the third edition of Dr. Oscar Hertwig's

"Lehrbuch der Entwicklungsgeschichte des Menschen und der Wirbelthiere." The volume is entitled "Text-Book of the Embryology of Man and Mammals." The translator, in his preface, expresses his belief that the work "covers the field of vertebrate embryology in a more complete and satisfactory way than any book hitherto published in English."

THE latest instalment of the Proceedings of the Academy of Natural Sciences of Philadelphia contains a valuable paper, by Prof. E. D. Cope, on the Batrachia and Reptilia of North Western Texas. The statements presented in the paper are based on collections made along the eastern border of the Staked Plain of Texas, between Big Spring (on the Texas Pacific R. R.) on the south, and the Salt Fork of the Red River, near Clarendon (on the Denver and Fort Worth R. R.) on the north, a distance of about 250 miles. The collections were made incidentally to geological and palæontological explorations conducted by a party of the Geological Survey of Texas, which was under the direction of Mr. William F. Cummins. While attached to this party Prof. Cope picked up such specimens as came in his way, and a good many others were obtained by Mr. Cummins and by Mr. William L. Black of the party. The total number of species enumerated is thirty-three. The paper may be regarded as supplementary to one published as Bulletin 17 of the U.S. National Museum in 1880, on the Zoological position of Texas.

THE following are the lecture arrangements at the Royal Institution before Easter:—Sir Robert Stawell Ball, six lectures (adapted to a juvenile auditory) on astronomy; Prof. Victor Horsley, ten lectures on the brain; the Rev. Canon Ainger, three lectures on Tennyson; Prof. Patrick Geddes, four lectures on the factors of organic evolution; the Rev. Augustus Jessopp, three lectures on the great revival—a study in mediæval history; Prof. C. Hubert H. Parry, four lectures on expression and design in music (with musical illustrations); the Right Hon. Lord Rayleigh, six lectures on sound and vibrations. The Friday evening meetings will begin on January 20, when a discourse will be given by Prof. Dewar on liquid atmospheric air; succeeding discourses will probably be given by Mr. Francis Galton, Mr. Alexander Siemens, Prof. Charles Stewart, Prof. A. H. Church, Mr. Edward Hopkinson, Mr. George Simonds, Sir Herbert Maxwell, Bart., the Right Hon. Lord Rayleigh, and other gentlemen.

THE micro-organism which has been shown to be the exciting cause of tetanus or lockjaw is just now especially attracting the attention of bacteriological investigators. Kitasato, who it will be remembered was the first who successfully isolated the bacillus of tetanus, has been continuing his researches on the protective inoculation of animals against this malady. In the current number of the *Zeitschrift für Hygiene* appears an account of some extremely interesting results which he has obtained with mice and guinea-pigs. In his experiments Kitasato introduced subcutaneously into these animals small splinters of wood which had been previously soaked in bouillon-cultures of tetanus, so prepared that only the spores were present. He wished in this way to imitate as nearly as possible the actual manner in which tetanus is communicated, and which in consequence of the sensitiveness of the bacillar form to heat and light and the extremely refractory nature of the spores, is almost invariably due to the accidental introduction of the latter. This theory is also supported by the fact that between the infliction of the wound and the development of symptoms of tetanus there is invariably a distinct lapse of time, during which the spores grow into bacilli and elaborate their toxic products within the system of the animal affected, after which the typical appearances of tetanus arise. The protective material used in these investigations was the serum of a horse artificially rendered immune against tetanus, and in every case out of those mice which had received a small wood-splinter two were put aside and not subsequently inoculated with the protective serum. Kitasato found, as he had expected, that a definite period of time elapsed between the introduction of the splinter and the development of tetanus symptoms; but with hardly an exception, all those mice subsequently treated with the serum recovered, whilst those which had received no protective treatment died exhibiting the typical characteristics of tetanus. Moreover, it was found that the earlier the application of the serum took place after the infection and quite irrespective of the appearance of any signs of tetanus, the more successful was the result and the smaller the dose of serum necessary, whilst when the wood-splinters and the serum were introduced together no symptoms whatever of tetanus declared themselves. The same successful results were obtained in the case of guinea-pigs. In connection with the excessively hardy nature of the spore-form of tetanus, Hervieux jean (*Ann. de la Soc. méd-chir. de Liége*, 1891) has found that even after eleven years such spores still retain their power for mischief. A small fragment of wood was extracted from the ankle of a child who had died of tetanus, and after being kept for nearly eleven years part of it was introduced under the skin of a rabbit, which afterwards died of tetanus. The infection was further confirmed by the discovery of tetanus bacilli in the pus of the wound.

THE chloraurates and bromaurates of cæsium and rubidium have been prepared by Messrs. Wells and Wheeler, and are described in the current number of the *Zeitschrift für Anorganische Chemie*. They are all four beautifully crystalline substances. The crystals, which have been measured by Mr. Penfield, belong to the monoclinic system, and form an isomorphous series of identical habitus. These salts are so comparatively insoluble in water that they are obtained in the form of crystalline precipitates when concentrated solutions of chlorides or bromides of cæsium or rubidium are mixed with strong solutions of chloride or bromide of gold. They are, however, sufficiently soluble to admit of recrystallization from water. The crystals of cæsium chloraurate, $CsAuCl_4$, exhibit an orange-yellow colour; those of the corresponding rubidium salt, $RbAuCl_4$, possess a more deeply orange tint; while the two bromides, $CsAuBr_4$ and $RbAuBr_4$, are jet-black but yield a dark red powder upon pulverization. The cæsium compounds are much less soluble than the rubidium ones, so that the crystals are usually much smaller. The more soluble rubidium salts readily form very large crystals; the chloride in particular yields crystals whose size appears only to be limited by that of the crystallizing vessel and the depth of the solution. The crystals, however, whether large or small, all partake of the same character; they are elongated prisms terminated by the basal plane, orthodome, clinodome, and small pyramidal planes. The faces are usually extremely brilliant, but those of the bromides are often singularly hollow or cavernous. In addition to this well-defined series, another chloraurate of cæsium has been obtained containing water of crystallization. This salt, $2CsAuCl_4.H_2O$, is formed when a large excess of gold chloride is present compared with the amount of cæsium chloride. It separates in the form of light orange-coloured tabular crystals belonging to the rhombic system, which exhibit the peculiar property of undergoing an internal change accompanied by elimination of the water of crystallization, within a few minutes of their removal from the mother liquor. The change is probably due to the passage of this hydrated salt into the relatively more stable anhydrous chloraurate described above. It betrays itself in a most interesting manner under the microscope, in polarized light. When a crystal plate is removed from the mother liquor, rapidly dried by means of blotting-paper and placed under the microscope, the Nicols being crossed, it simply produces the usual effect of causing the field to become coloured with some homogeneous tint. But after the expiration of three or four minutes the molecular change begins to be rendered apparent at the circumference of the field by a rapid augmentation of the polarizing effect; in another moment it commences to dart across the field in all directions, the brilliantly coloured rays being feathered with offshoots, reminding one of the rays of crystallizing ammonium chloride. This beautiful effect continues until, in less than ten minutes after the removal of the crystal from the mother liquor, the rearrangement of the molecules has become so general that light is no longer able to penetrate, and the crystal becomes completely opaque. Messrs. Wells and Wheeler have also attempted to prepare the analogous compounds containing iodine, but have not yet obtained them in a condition so pure or well crystallized as the salts described above.

THE additions to the Zoological Society's Gardens during the past week include a white-fronted lemur (*Lemur albifrons* ♀) from Madagascar, presented by Mr. M. C. Parker; a brown capuchin (*Cebus fatuellus* ♂) from Brazil, presented by Mr. Earle Tudor Johnson; a large-eared fox (*Otocyon megalotis*) from Mashonoland, South Africa, presented by Mr. B. B. Weil; two black-backed jackals (*Canis mesomelas*) from South Africa, presented by Capt. Ralph H. Carr-Ellison; a common fox (*Canis vulpes* ♀) from Arabia, presented by Miss Morgan; a leadbeater's cockatoo (*Cacatua leadbeateri*) from Australia, presented by Lieut.-Colonel Warton; a Rhesus monkey (*Macacus rhesus*) from India, deposited.

OUR ASTRONOMICAL COLUMN.

COMET HOLMES (NOVEMBER 6).—The following is the ephemeris for Comet Holmes for the ensuing week:—

1892.	R.A. (app.). h. m. s.	Decl. (app.). ° ′	Log *r*.	Log Δ.
Dec. 15	0 49 34	+34 50·1		
16	50 15	45·8	0·4004	0·2813
17	50 57	41·6		
18	51 41	37·5		
19	52 27	33·6		
20	53 14	29·8	0·4027	0·2931
21	54 3	26·1		
22	0 54 53	+34 22·6		

Owing to the extremely bad weather, observations of this comet have not been numerous, but from all accounts not much change has taken place in the general appearance, except that the central nucleus seems to possess two small tails, which extend towards the ragged edge of the exterior portion.

COMET BROOKS (NOVEMBER 20, 1892).—Last week the only ephemeris of this comet at hand was one showing its position every fourth day, but Prof. Kreutz has now communicated to *Astronomische Nachrichten*, No. 3132, a daily ephemeris, from which the following is extracted:—

1892.	R.A. (app.). h. m. s.	Decl. (app.). ° ′	Log *r*.	Log Δ.	Br.
Dec. 15	13 50 10	+31 57·3			
16	54 6	33 17·2	0·0974	0·0001	3·67
17	13 58 19	34 41·2			
18	14 2 53	36 9·5	0·0946	9·9775	4·13
19	7 51	37 42·2			
20	13 17	39 19·3	0·0921	9·9550	4·63
21	19 13	41 0·8			
22	25 46	42 46·6	0·0898	9·9332	5·17

From the column showing the brightnesses it will be seen that a considerable increase in this comet is taking place. The comet will be easily found by the fact that it lies in the prolongation of a line joining β and γ Bootis (December 18) at a distance equal to that between those two stars.

THE NEW BROOKS' COMET.—The following positions of this comet are reported from Marseilles, by MM. Esmiol and Fabry:—

Date.	Marseille Mean Time. h. m. s.	App. R.A. h. m. s.	App. P.D. ° ′ ″
Nov. 24	17 45 16	13 3 14·6	74 51 33
24	17 6 53	13 4 39·39	74 33 18·1
29	16 43 46	13 11 1·76	72 11 46·7
30	16 41 49	13 12 45·77	71 34 49·0

The comet presented the appearance of a nebulosity about 1′ in diameter, diffuse at the edges, and brighter towards the centre, but without a well-defined nucleus. Its brightness was about that of a star of eleventh magnitude.

NOVA AURIGÆ.—Nova Aurigæ has again increased in magnitude, observations showing that visibly it is 8·5, while photographically it is three magnitudes fainter.

ASTRONOMY AT COLUMBIA COLLEGE, U.S.A.—The latest number of the bulletin issued by this college informs us that with the consent of the governing body of the New York Hospital and the college trustees, a new but small observatory is about to be erected on the site Bloomingdale. The instrument, which is at present being constructed by Wauschaff, at Berlin, is a zenith telescope, and it is one of a pair which is going to be used for observations to obtain accurate determinations of the variations of terrestrial latitudes. The other instrument, by order of the Italian government, is going to be mounted at the Royal Observatory of Capodimonte. Both instruments will soon be, if not already, in working order; the observers in America are Prof. Rees and Mr. Jacoby, while M. Higola will undertake the Italian observations.

The library of this college has been recently very much increased by the purchase of the fine library of astronomical and physical works belonging to Mr. Struve, former director of the Pulkowa observatory. This addition amounts to no less than 4361 bound and unbound books, together with 3056 pamphlets.

COMPANION TO THE OBSERVATORY FOR 1893.—This annual *Companion* for the coming year is very similar to the one last published. Mr. Denning gives a list of the principal meteor showers deduced from recent observations, while ephemerides for the planets, together with their satellites, are also inserted. Solar observers will find the ephemeris given on page 22 very useful, this table giving the position-angle of the sun's axis, and the heliographic latitudes and longitudes of the centre of his disc. In addition to several other handy tables and ephemerides, the times of minima of variable stars not of the Algol type, variable stars of the Algol type, maxima and minima of variable stars, and finally a table of double stars are also included.

GEOGRAPHICAL NOTES.

MAJOR THYS, who has recently returned from the Congo Free State, reports that the railway from Matadi to Stanley Pool is progressing rapidly. The works are practically completed for only 14 kilometers out of the 400, but this includes the most difficult region, including the greater part of the ascent to the plateau. In a few months it is hoped that 40 kilometers will be completed, and the malarial coast-belt can then be traversed rapidly, obviating a serious risk to the health of travellers to the Upper Congo.

WE are pleased to find that the Manchester Geographical Society has published the concluding part of the seventh volume of its Journal although, as we had occasion to remark on the appearance of the previous part, it is greatly to be regretted that the people of Manchester do not take a greater interest in a Society which is one they have reason to be proud of. It is, we are convinced, solely to this want of local appreciation that the Journal has to be issued so far behind its proper date as to impair the usefulness of its contents. In the current number there is an interesting paper on Japan by Mr. W. M. Steinthal.

MR. G. A. CRAIG has, we understand, resigned the secretaryship of the Liverpool Geographical Society on account of ill-health.

THE *Scottish Geographical Magazine* for this month contains a paper by Captain Lugard, entitled "Characteristics of African